

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

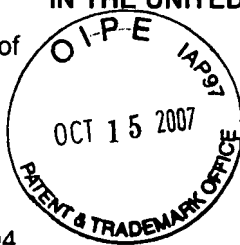
Atty ARC-1035-492  
Dkt.

DAIROKU et al

Serial No. 10/764,444

Filed: January 27, 2004

Title: METHOD OF MANUFACTURING WATER-ABSORBING SHAPED BODY

C# M#  
C/A.U. 1732

Examiner: Godfrey

Date: October 15, 2007 (Monday)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**RESPONSE/AMENDMENT/LETTER**

This is a response/amendment/letter in the above-identified application and includes an attachment which is hereby incorporated by reference and the signature below serves as the signature to the attachment in the absence of any other signature thereon.

☐ **Correspondence Address Indication Form Attached.****Fees are attached as calculated below:**

Total effective claims after amendment 0 minus highest number  
previously paid for 20 (at least 20) = 0 x \$50.00 \$0.00 (1202)/\$0.00 (2202) \$

Independent claims after amendment 0 minus highest number  
previously paid for 3 (at least 3) = 0 x \$210.00 \$0.00 (1201)/\$0.00 (2201) \$

If proper multiple dependent claims now added for first time, (ignore improper); add  
\$370.00 (1203)/\$185.00 (2203) \$

Petition is hereby made to extend the current due date so as to cover the filing date of this  
paper and attachment(s)  
One Month Extension \$120.00 (1251)/\$60.00 (2251)  
Two Month Extensions \$460.00 (1252)/\$230.00 (2252)  
Three Month Extensions \$1050.00 (1253)/\$525.00 (2253)  
Four Month Extensions \$1640.00 (1254)/\$820.00 (2254)  
Five Month Extensions \$2,230.00 (1255)/\$1115.00 (2255) \$

Terminal disclaimer enclosed, add \$130.00 (1814)/ \$65.00 (2814) \$

☐ Applicant claims "small entity" status. ☐ Statement filed herewith

Rule 56 Information Disclosure Statement Filing Fee \$180.00 (1806) \$ 0.00

Assignment Recording Fee \$40.00 (8021) \$ 0.00

Other: \$ 0.00

**TOTAL FEE \$ 0.00**☐ **CREDIT CARD PAYMENT FORM ATTACHED.**

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140. A duplicate copy of this sheet is attached.

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By Atty: Arthur R. Crawford, Reg. No. 29,327

Signature: \_\_\_\_\_



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of

DAIROKU et al

Atty. Ref.: 1035-492; Confirmation No. 8698

Appl. No. 10/764,444

TC/A.U. 1732

Filed: January 27, 2004

Examiner: Godfrey

For: METHOD OF MANUFACTURING WATER-ABSORBING SHAPED BODY

\* \* \* \* \*

October 15, 2007 (Monday)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**RESPONSE**

This responds to the Official Action of July 13, 2007.

The Official Action contains three prior art-based rejections. The first directed to claims 1, 3-11, 13, 15 and 18 is based on anticipation. The other two rejections, directed to claims 2, 12 and 14, are based on alleged "obviousness". All three rejections feature U.S. patent 6,365,644 to Yamamura et al (hereinafter "Yamamura") as the sole (§102) or primary (§103) reference.

There are no prior art rejections directed to claims 16 and 17, so it is counsel's understanding that these claims are free of the prior art and would be allowable if written in independent form. Please confirm this understanding.

Yamamura et al discloses a method of curing a photo-curable resin composition suitable for photo-fabrication of three-dimensional objects, i.e., to a method of manufacturing a three-dimensional object, that is a cured object. The three-dimensional object, which is the objective of Yamamura et al, is used for a design model, a trial product for confirming functionality, or a master mold. In order to use the three-dimensional object as a trial product, for example, it is necessary that the three-dimensional object have high dimensional accuracy in accordance with

the design in fine processing, as well as mechanical strength and heat resistance sufficient to withstand conditions of use (see lines 8 to 15 in column 2, lines 50 to 58 in column 2, and lines 20 to 26 in column 18).

Because it is required that the three-dimensional object have high dimension accuracy in accordance with the design in fine processing and mechanical strength etc., sufficient to withstand conditions of use, it is impossible for the three-dimensional object of Yamamura et al to have a water-absorbing property. Judging from the required properties, it is apparent that Yamamura et al neither discloses nor suggests that the obtained three-dimensional object has a water-absorbing property.

A reason for this is as follows: If the three-dimensional object has a water-absorbing property, it absorbs water and accordingly swells and changes its shape. Thus, it is impossible to maintain Yamamura's required high dimensional accuracy that is in accordance with the design in fine processing. Specifically, if the three-dimensional object has a water-absorbing property, the three-dimensional object absorbs water and accordingly swells thereby changing its shape, so such a three-dimensional object cannot be used for a design model, a trial product for confirming functionality, or a master mold. In other words, such a three-dimensional object having a water-absorbing property cannot exhibit the effect described in Yamamura et al. Hence, a three-dimensional object having a water-absorbing property is not disclosed in Yamamura et al.

As such, it is apparent that the invention of the present application and Yamamura et al pertain to different technical fields, so it is apparent that the technical content of the invention of the present application and the technical content of Yamamura are different from each other.

Accordingly, required cured objects and their properties for the invention of the present application and Yamamura et al are completely different from each other, so it is apparent that the resin composition used in Yamamura et al must be different from the monomer composition used in the invention of the present application, in terms of its composition.

The monomers disclosed in Yamamura et al, column 1, line 47 and subsequent lines, such as "urethane(meth)acrylate, oligoester(meth) acrylate, and epoxy(meth)acrylate", are not water-soluble, unlike the monomers defined in the claims of the present patent application.

The monomer composition used in the invention of the present application is different from the monomer composition materials used in the secondary references of Phan et al (US

6,022,610) and Chmelir et al (US 4,893,999), in terms of their composition, a clear indication these references cannot be combined with Yamamura.

Specifically, in Yamamura et al, it is necessary to "use a cationic photo polymerization initiator", it is necessary that "the resin composition contains an oxetane ring containing compound and an epoxy group containing compound" so it does not have a water-absorbing property, and it is optional to "use an ethylenically unsaturated compound as (an)other component of the resin composition" (see column 13, line 47 to column 15, line 32).

That is, in Yamamura et al the "ethylenically unsaturated compound" is an optional component. As such, the resin composition of Yamamura et al is completely different from the monomer composition of the invention of the present application, i.e., the monomer composition in which "water-soluble ethylenically unsaturated monomer" must be present. Note that Yamamura et al does not disclose that an "acrylic acid (salt) is used as a main component that makes up 50 mol% or more of the water-soluble ethylenically unsaturated monomer" (see page 7 of the description).

Further, the invention of the present application and Yamamura et al are also different in the polymerization methods actually performed.

Yamamura's curing method is "obtaining a three-dimensional object (cured object) by unifying a plurality of a photo-curing resin layers provided by repeating a light radiating step for predetermined times".

That is, in the method of Yamamura et al, it is necessary to "carry out polymerization by selectively radiating light". Yamamura et al never discloses the polymerization method employed in the invention of the present application, i.e., the polymerization method in which "aqueous solution containing the monomer composite material is used (polymerization is carried out using the aqueous solution)" and "aqueous solution, which contains a polymer as a part thereof, is shaped (by stopping radiation of light) (shaping step)". In Yamamura et al, polymerization is carried out using no solvent, so Yamamura et al does not disclose the use or presence of a solvent.

In other words, Yamamura et al does not disclose a shaping step which is used in the manufacturing method according to the invention of the present application and in which "(radiation of the light is stopped, and) the aqueous solution, which includes a polymer as a part

thereof, is shaped".

Nor is the step used in the manufacturing method according to the invention of the present application disclosed in either of the Phan et al or Chmelir et al secondary references.

With the polymerization method of the invention of the present application, the aqueous solution is gelled, so shaping the water-absorbing shaped body is easy. This makes it possible to directly shape the water-absorbing shaped body into a desired shape in the polymerization step. In contrast, Yamamura et al requires a complex shaping step (curing method) of obtaining a three-dimensional object (cured object) by unifying a plurality of a photo-curing resin layers provided by repeating a light radiating step for predetermined times. As such, the shaping step in the invention of the present application is completely different from that in Yamamura et al. Of course, the object and effect of the invention of the present application are completely different from those of Yamamura et al.

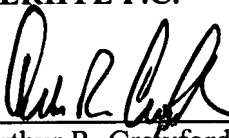
Note that Yamamura et al discloses that "the light radiation step is repeated for predetermined times with a pattern of light radiation being changed or unchanged". Thus, it appears that Yamamura et al does not disclose but suggests that polymerization is carried out by intermittently radiating light. However, as described above, the polymerization step of the invention of the present application is completely different from that of Yamamura et al.

Reconsideration and favorable action are solicited.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By: \_\_\_\_\_

  
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